



Water supply code table

Code	Details
	"Main Water Supply pipe Type (PPR) Size (4 inches) Depth (1.2 M)"
	"Water Supply pipe Type (PPR) Size (2 inches) Depth (0.75 M)"
	"Water Supply pipe Type (PPR) Size (1 inches) Depth (0.75 M)"
	"Water Supply pipe Type (PPR) Size (0.5 inches) Depth (0.25 M)"
	Underground Water Tank (51,500 Liter)()
	Fire Extinguisher Tank (18000 Liter)
	Water Tanks 3types (10000 lit,7000 lit,5000 lit)
	Pump 2types (4 hp power : 1.5 hp power).
	Valve
	Non-return valve
	"* Spray Angle: Adjustable From 90 - 180 - 360 * Coverage Range (Spray Diameter) 8 M * Operating Pressure: 4 Bar. * Water Quantity: 30 Liters/Minute."
	"* Spray Angle: Adjustable From 90 - 180 - 360 * Coverage Range (Spray Diameter) 5 M * Operating Pressure: 2.5 Bar. * Water Quantity: 15 Liters/Minute."
	"* Spray Angle: Adjustable From 90 - 180 - 360 * Coverage Range (Spray Diameter) 3.6 M * Operating Pressure: 1.5 Bar. * Water Quantity: 8 Liters/Minute."
	Drip Spray (Graded Area)

Electricity supply code table

	Details
	33 KV Power Cable. (Aluminum - steel ACSR 300/50)
	415 V Power Cable. (Aluminum - NA2XS(F)2Y
	Manual Switch.
	Transformer
	Main Control Panel
	Control Panel.
	Solar Panel.
	Solar Lighting.

"Solar System Design for 30% Energy Dependency:

Project's Daily Energy Consumption:

Total estimated load: 216 kWh/day (administration, classrooms, labs).
Solar Energy Contribution (30%):

Required from solar: 64.8 kWh/day.
System Capacity:

Peak sunlight in Sudan: ~6 hours/day.
Required capacity: 10.8 kW.
Number of Solar Panels:

Using 400 W panels: 27 panels.
Space Requirements:

Each panel needs ~2 m².
Total area: 54 m²."

Sudan University of Science and Technology

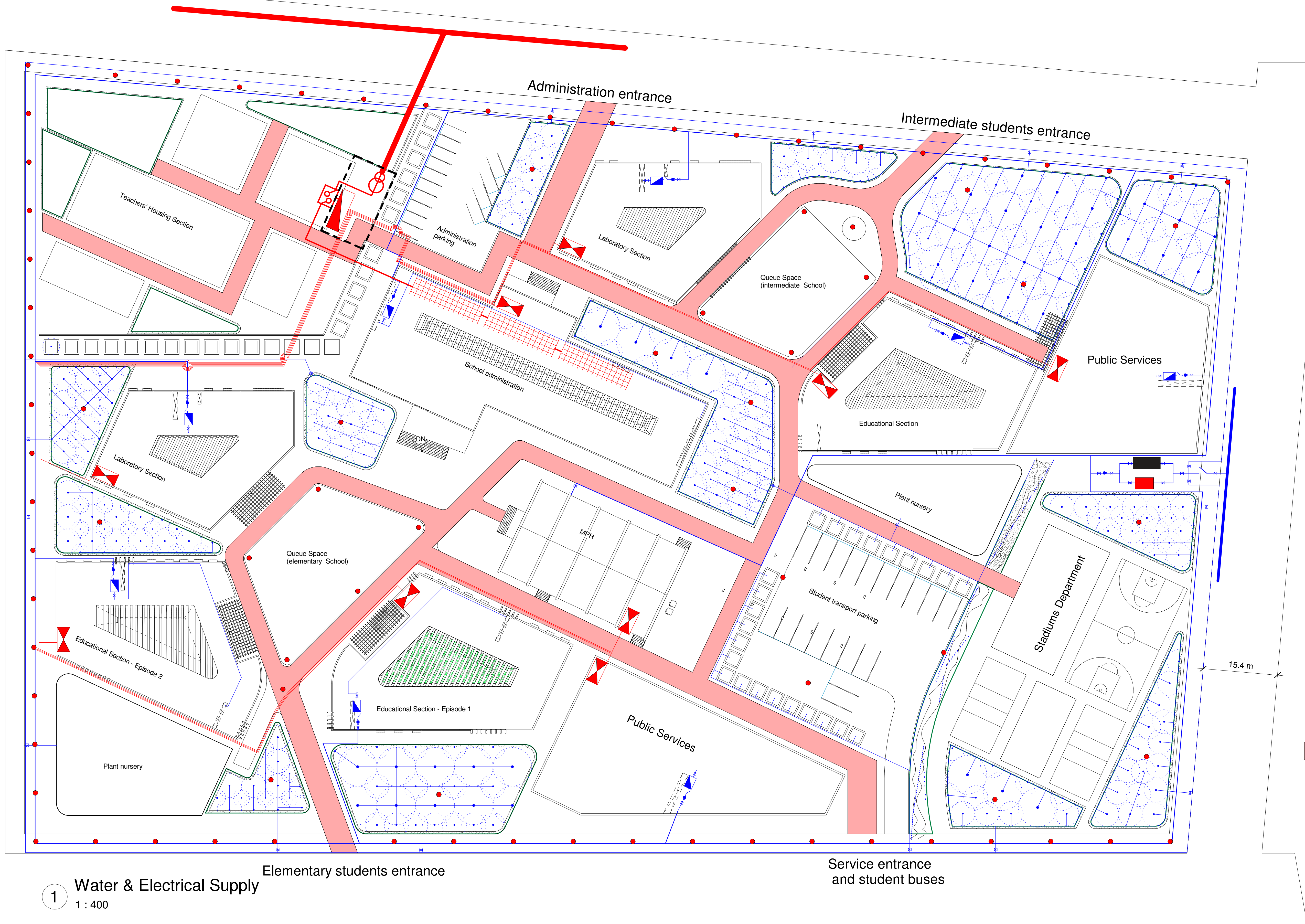
"Faculty of Architecture and Planning
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Technical Solutions Stage

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03 Water and electrical supply connections



1 Water & Electrical Supply
1 : 400

1 Determine the number of users and the amount of water:

There are 540 Student in the School.

There are 36 teachers , There are 20 employee , There are 10 worker.

Amount of water required = Daily use water + Fire fighting water

From the water quantity table:

A student in a school with a cafeteria and no gym needs 20 US gallons of water per day.

$540 \times 20 = 10800$, $10800 \times 3.8 = 41000$ liters per day.

Office work requires 15 US gallons per teacher.

$66 \times 15 = 990$, $990 \times 3.8 = 3700$ liters per day.

2 Daily consumption = $(41000 + 3700 + 15\%)$
 $= 51.500$ liters will be consumed during the day

we Needs fire-fighting rollers with a capacity of 1800 liters per hour,
which is sufficient to fight the fire until the Civil Defense forces arrive to complete
extinguishing the fire.

3 Fire fighting water = 1800 liters will be used up within an hour.
in 10 hour need 1800×10 liters = 18000 liters